

### CONSEQUENCES OF THE MORTALITY OF DISCARDED SPANNER CRABS (*RANINA RANINA*) IN A TANGLE-NET FISHERY — LABORATORY AND FIELD EXPERIMENTS

In response to evidence of decreasing catch rates, the effects of disentanglement from commercial tangle-traps on the mortality of undersize, discarded spanner crabs, *Ranina ranina* (Linnaeus), was examined for a fishery in New South Wales, Australia. Firstly, the amount of damage sustained by discarded crabs was quantified. Three main methods of disentanglement were used by commercial fishermen: careful removal, causing no damage; quick removal, where any entangled dactyli are broken off (average 3.95 dactyli per crab); and the fastest method whereby crabs are pulled off and entangled limbs and dactyli are broken off (average 2.9 dactyli and 0.8 limbs per crab). The effects of these various kinds of limb damage on the mortality of undersize *R. ranina* were tested in an aquarium experiment in which replicate crabs were damaged in the ways described above and compared to undamaged controls. In addition, a similar (though

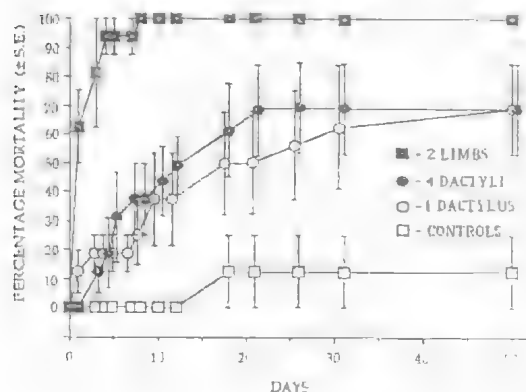


FIG. 1. Mortality of damaged spanner crabs in aquaria.

shorter-term) experiment was performed in the field using enclosures buried in the substratum near the commercial fishing grounds.

The results showed quite significant rates of mortality due to disentanglement; 60–70% of crabs with one or more dactyli removed died within 50 days, whilst 100% of crabs which lost whole limbs (after being pulled off nets) died after 8 days. The data also show that 75% of crabs that are caught by commercial tangle traps are less than the minimum legal size, and that sexual dimorphism in this species means that 85% of females are smaller than this legal size.

The results have implications on the effect of this mortality on subsequent exploitable stocks, the fecundity of the population, the usefulness of current size restrictions and the need for a better method of capture.

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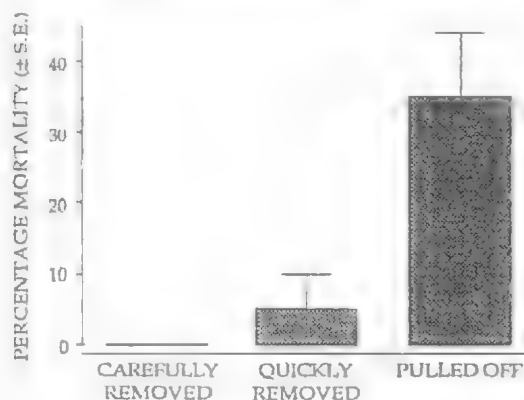


FIG. 2. Mortality of damaged spanner crabs in the field over 24 hours.

### ALTERNATIVE AERATION SYSTEM FOR INTENSIVE PRAWN PONDS

An alternative aeration system was designed and used for intensive prawn production in the Southern Philippines. Four ponds were used for two crops with a stocking density of 23–39 post-larvae per sq.m. Dissolved oxygen, salinity and temperature were monitored. D.O. fluctuated from 3.5–10 ppm; salinity from 15–25 ppt; and temperature from a minimum of 27°C to a maximum of 32°C. Readings on nitrates, H<sub>2</sub>S and ammonia were not taken. Survival rates after 130 days of culture for pond No. 2 were 79% (first cropping) and 85% (second cropping). Pond No. 1 had low survival rates due to the failure of the blower (human error) to operate at the scheduled time.

Artificial aeration such as the Air-lift System appears to be feasible in high intensive prawn farming. The cost of installation and maintenance appear to be the key to its adoption.

The results of the two croppings in each pond showed that this artificial aeration system working hand in hand with a good water system, will give good harvest results. The system appears to be able to maintain a D.O. level above the 4 ppm needed for ideal rearing.

Considering the cost of materials, energy (power) consumption, maintenance and acquisition costs of major equipment, this alternative has great potential for larger scale application in the aquaculture industry.

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